

celestial navigation system and perhaps its magnetic navigation system. This resulting disorientation causes the birds to fly to the light source and circle the light source at the tower, causing the bird to be unable to establish its directional cues, and greatly increase its probability of striking the tower and guy wires, flying into other birds also circling, or losing most navigational capability and flying into the ground or ancillary structures. Documentation of this is found in many scientific documents, for example:

In a study that was conducted in South Carolina during fall migration, Gauthreaux and Belser monitored bird flights on 14 nights at two towers, one tower (1,667') with incandescent flashing red and solid red lights (L-810) and one tower (2,016') with white strobe lights, and a nearby control site. General linear models revealed that the number of flights was influenced by the day of observation and tower type. Significantly more birds were observed at the tower with the combination of red lights than at the tower with white strobe lights or the control site. Furthermore, lighting type was significantly associated with number of nonlinear flight paths, with twice as many nonlinear flight paths at the tower with red lights than at the tower with white strobe lights on average, and nearly 14 times more nonlinear flight paths at the red lighted tower than at the control site.

The results suggest that although white strobe lights cause birds to take more nonlinear flight paths, they do not result in birds accumulating around the tower. Gauthreaux and Belser concluded that the significantly greater number of paths per 20 minutes around the tower with red lights resulted from the attraction of the lights, added to the influence of the lights on orientation, leading to accumulations of individuals near the towers with solid red and flashing red lights. Gauthreaux, S.A., Jr., and C. Belser. 2006. *Effects of artificial night lighting on migrating birds*. In C. Rich and T. Longcore (eds.), *Ecological Consequences of Artificial Night Lighting*. Island Press, Covelo, California.

Dr. W. Taylor, Professor Emeritus of Biology at Central Florida University, reports drastic reduction of bird mortality when lighting of a tower in Orlando, Florida was changed from solid red and flashing red lights to white strobe lights (personal communication with Dr. Travis Longcore). The tower was the site of large bird kills, and Professor Taylor and colleagues had collected more than 10,000 birds over the years and reported these kills in the literature. In 1974, the ~1,000-foot guyed tower blew down, and was replaced with a taller guyed tower with white strobe lights. Following the replacement, bird mortality was reduced drastically and no mass kills (i.e., >100 birds) were ever again reported at the site. Taylor, W.K., and B.H. Anderson. 1973. *Nocturnal migrants killed at a south central Florida TV tower, autumn 1969-1971*. Wilson Bulletin 85:42-51. Taylor, W.K., and B.H. Anderson. 1974. *Nocturnal migrants killed at a south central Florida TV tower, autumn 1972*. Florida Field Naturalist 2:40-43.

Why be concerned about light pollution.?, Broderick, B., Royal Astronomical Society of Canada Bulletin (June 1995). Over a period of 10 years, nearly 23,000 birds were killed by flying into floodlight lit smokestacks at a power plant near Kingston, Canada. The problem was resolved by replacing the floodlights with a white strobe light. Other research shows that on nights with poor visibility when birds are attracted to lit towers

and encircling a tower, turning off the lights results in an almost immediate response by the birds. They stop circling and leave the tower and resume their migration.

Attraction of nocturnal migrants by lights on a television tower, Cochran, William W. and Richard R. Graber, *Wilson Bulletin*, 70:378-380, (1958). Cochran and Graber made visual and acoustic observations of birds circling a 984-ft TV tower near Champaign, Illinois during a night with overcast and light mist. They counted call notes from migrants and made observations of the number of birds flying in the vicinity of the tower with a spotlight. Cochran was the engineer at the TV station and was able to control the lighting of the tower. By turning off the lights for short periods of time, he and Graber were able to confirm what many had suspected - that lights were causing the birds to concentrate around the tower. Within a short period of turning off the tower lights, the swarm of birds hanging around the tower dispersed.

Another published article similarly concludes that strobe lights with a complete break between flashes would reduce bird mortality at tall structures. Jones, J., and C.M. Francis. 2003. *The effects of light characteristics on avian mortality at lighthouses*. *Journal of Avian Biology* 34:328-333.

Dr. Will Post, Curator of Ornithology at the Charleston, SC Museum reports that during a low cloud ceiling, rainy two nights, 329 dead neotropical migratory birds were collected at a Mt. Pleasant, South Carolina TV tower in September 2003. Two other coastal TV towers, at Awendaw, about 10 miles NE of the Mt. Pleasant towers, also had significant kills during the early 1980s. In about 1990, these two coastal towers switched from red incandescent steady burning lights (L-810), alternating with red blinking lights (L-864), to white strobe lights (L-865). Will Post and others have found few dead birds around them since. This verifies what other researchers have found: strobe lights cause significantly less mortality than red steady burning lights.

This scientific evidence is strong correlating lighting with avian fatalities. See the detailed discussion and review of the scientific literature in the Longcore et al. LPP filing in this NPRM. The most critical factor in this lighting is whether the lights burn steadily at night or are pulsed, that is whether the lights flash, strobe, or blink periodically. Such pauses in a light source greatly diminish a bird's attraction to the light source and hence, the fatalities. As noted in the Longcore et al. LPP filing in this NPRM, "Verheijen, who wrote the classic review on the attraction of animals to light, concludes that, 'Success has been achieved in the protection of nocturnal migrant birds through interrupting the trapping stimulus situation by... replacing the stationary warning lights on tall obstacles by lights of strobe or flashing type.'" Citing Verheijen, F.J. 1958. *The mechanisms of the trapping effect of artificial light sources upon animals*. *Archives Néerlandaises de Zoologie* 13:1-107 and Verheijen, F.J. 1985. *Photopollution: artificial light optic spatial control systems fail to cope with. Incidents, causations, remedies*. *Experimental Biology* 44:1-18.

Some birds also fly directly into the tower structure and guy wires, even in daytime but all mass mortalities have been recorded at night, almost always during low cloud ceiling/poor visibility.

There is much more in the scientific literature on the causes of tower kills, e.g. see the proceedings of the Avian Mortality at Communication Towers Workshop at: <http://www.towerkill.com/workshop/proceedings/index.html>

The FCC NPRM cites the Michigan research by Dr. Joelle Gehring and premises several inquiries based on previous research publications on this research. Since the NPRM was published, Dr. Gehring and Dr. Kerlinger have combined and finalized their research into two parts, one on tower lighting and the other on height and guy wires. The research was conducted during five migratory seasons (spring and fall) from September 2003 to September 2005. Twenty-four towers were studied in all, 21 Michigan State Police communication towers that were 380'-480' AGL, and three private towers that exceeded 1,000'.

The researchers examined the impact tower lighting had on bird mortality and compared towers with steady burning red L-810 lights and flashing L-864 lights, with towers using only L-865 white strobes, and towers with the steady burning red L-810 lights extinguished and operating only with flashing L-864 lights. The Michigan research (Report II) authors note that "Our results demonstrate that avian fatalities can be reduced dramatically at guyed communication towers, perhaps by 50-70%, by removing steady burning L-810 lights...Kerlinger et al. (in press) qualitatively compared fatality rates of night migrants at wind turbines lit only with red flashing strobe-like lights (L-864) with fatality rates at turbines that were not lit. They found no difference and suggested that red strobe-like lights did not appear to attract or disorient night migrants, resulting in collisions with wind turbines ranging in height from just over 60 m to nearly 122 m in height. These data support our results and interpretation that flashing beacons did not attract or disorient as many birds as non-flashing lights. Kerlinger, P., J. Gehring, W.P. Erickson, and R. Curry. In Press. *Federal Aviation Administration obstruction lighting and night migrant fatalities at wind turbines in North America: A review of data from existing studies*...Our study is the first to compare collision rates at communication towers equipped with different types of FAA obstruction lighting. The results also provide the first scientifically validated and economically feasible means of reducing fatalities of night migrating birds at communication towers...By simply removing the L-810 lights from communication towers, it is possible that more than one to two plus million bird collisions with communication towers might be averted each year...The elimination of steady burning, red L-810 lights, leaving only flashing L-864 lights would also be beneficial for tower owners. Although fatalities would not be completely eliminated, the numbers of fatalities would undoubtedly be reduced greatly. The economic incentive for removing L-810 lights is substantial. Electric consumption, and therefore electric costs, as well as tower maintenance costs (changing of bulbs -labor and bulb cost) would be greatly reduced. The elimination of these same lights would also benefit the Federal Communication Commission (FCC) and the Federal Aviation Administration (FAA). Because the FCC is tasked with licensing towers under the National Environmental Policy Act (NEPA), they should welcome a means of reducing

fatalities thereby increasing federal compliance with the Migratory Bird Treaty Act (MBTA). A similar situation exists for the FAA. By recommending L-810 steady burning red lights, the FAA advisory circular basically makes it difficult for tower owners and operators, not to mention the FCC, to comply with the MBTA. Removal of the L-810 lights from towers should be encouraged by both the FCC and FAA.” See Gehring, Joelle and Kerlinger, Paul, *Avian collisions at communication towers: II. The role of Federal Aviation Administration obstruction lighting systems*, Prepared for: State of Michigan (March 2007).”

The published work by Dr. Gehring and Dr. Kerlinger, and the other research and data cited herein, should end the FCC’s gridlock on making changes in lighting on existing towers and in the FCC antenna structure review, approval, and registration process to protect migratory birds. This should include changes for new towers in lighting, guy wires, and height as the authors note that their findings “provide managers and regulators with the first quantitative data for establishing best practices to minimize collision fatalities of migrating and other birds at federally licensed communication towers.” Guy wires and height are discussed elsewhere herein.

Any implications that adopting new rules to comply with the MBTA (or NEPA or ESA) somehow might interfere with the FCC goal of fulfilling the nation’s communication needs are without merit. Gehring and Kerlinger in Report II conclude that: “Changing lights on existing and new communication towers provides a feasible means to dramatically reduce collision fatalities at communication towers (two other methods include tower height reduction and guy wire elimination on new towers). One advantage of our findings is that lighting can be changed at minimal cost on existing towers and such changes on new or existing towers greatly reduces the cost of operating towers. Removing L-810 lights from towers is one of the most effective means of achieving a significant reduction in avian fatalities at existing communication towers.” See, again, Gehring, Joelle and Kerlinger, Paul, *Avian collisions at communication towers: II. The role of Federal Aviation Administration obstruction lighting systems*, Prepared for: State of Michigan (March 2007).

The authors cite a recent review of avian collision fatality data from studies conducted at 15 wind power facilities across the United States and at two sites in Canada was conducted to determine whether L-864 red flashing strobe-like FAA obstruction lights attract or disorient large numbers of birds leading to collisions of those birds with turbines. Fatality rates of night migrants at turbines 53.5 m to 117 m were examined and compared to turbines in the same turbine facility that were unlit. No large scale fatality events (>3 birds at one turbine in one night) were found at unlit turbines or turbines deployed only with L-864 lights and there were no significant differences found between fatality rates of turbines equipped with L-864 lights and turbines without such lights within the same facility. The authors concluded that “Unlike the combination of multiple sets of red flashing L-864 lights and steady burning red L-810 FAA obstruction lights at tall communication towers, the flashing lights on wind turbines in the studies examined herein do not appear to attract or disorient large numbers of night migrants.” Kerlinger, P., J. Gehring, W.P. Erickson, and R. Curry. Forthcoming. *Federal Aviation*

Administration obstruction lighting and night migrant fatalities at wind turbines in North America: a review of data from existing studies. Submitted to Wilson Journal of Ornithology in 2006.

This study again documents that strobe-like lighting, red FAA L-864's in this case, do not attract large numbers of birds at night and that fatalities at lit vs. unlit turbines did not differ statistically.

Another recent study has been published supporting the conclusions above and again documenting the importance of using strobe or flashing lights with a dark phase so as not to attract birds. In experiments with lights at ground level pointed at night into the sky, the researchers showed accumulations of birds around white, blue, and green solid lights, but not around flashing lights. Evans, W.R., Y. Akashi, N. Altman, and A.M. Manville II. 2007. *Response of night-migrating birds in cloud to colored and flashing light*. Report to Communications Tower Working Group.

Therefore, we fully support the FCC tentative conclusion that the use of medium intensity white strobe lights for nighttime conspicuity is to be considered the preferred lighting system over red obstruction lighting systems to the maximum extent possible without compromising aircraft navigation safety. This is based on the FAA's recommendation for such lighting where it will not compromise aircraft navigation safety, detailed in an FAA Memorandum of April 6, 2004. In that FAA document, the FAA concluded that: "Therefore, in consideration of the agreement between the FAA and the American Bird Conservancy, please advise your staff that medium intensity white strobe lights for nighttime conspicuity is to be considered the preferred system over red obstruction lighting systems to the maximum extent possible without compromising safety. Please refer to Chapter 6, Medium Intensity Flashing White Obstruction Light Systems, AC 70/7460-1K for specific guidance."

The FCC Chairman had noted on March 21, 2000 in a letter to the Director of the U.S. FWS that "we will process expeditiously any required lighting modifications (as recommended by the FAA)." This is the letter cited above where the FCC declined to perform an EIS under NEPA. Three years have passed since the FAA made its lighting recommendations for the use of FAA L-865 medium intensity white strobe lights on obstructions to better protect birds, and yet the FCC has not acted to incorporate these FAA findings and recommendations into its antenna structure approval and registration process as pledged by the FCC Chairman in 2000.

While we fully support the FAA Memo and the FCC tentative conclusion for the preferred use of medium intensity white strobe lights, we have previously advised the FCC and FAA that we believe that the science and practicality of aviation safety lighting dictates that if the white strobe lights cannot be used, the use of red strobes or pulsing or blinking lights is fully warranted from a bird protection standpoint. We state this because of problems the industry sometimes has with employing white strobes on communication towers because of local opposition, and because under the FAA guidelines, white strobes cannot be used in many situations. These latter situations include within three miles of an airport or in urbanized areas.

The critical factor, documented by the research cited above, is that red steady burning lights be avoided on all new towers and that these red steady burning lights be turned off or removed (retrofitted) on existing towers to preferably either white strobes or red strobes, or if not practicable, to red blinking lights.

In the U.S. FWS filed comments on this FCC NPRM dated February 2, 2007 that were signed by Acting Deputy Director Kenneth Stansell, the FWS states: "The scientific evidence also supports the conclusion that lights that flash or blink appear to be more important in minimally attracting birds than is the color of the blinking light (currently only white and red lights are allowed by the FAA as pilot warning colors on communication towers). To minimize the financial burden on tower owners and operators currently managing existing towers while minimizing impacts to migratory birds, the Service recommends that:

- 1) Once tower broadcast licenses expire and must be re-issued, tower lighting systems must be retrofitted preferably with minimum intensity, maximum off-phased white strobe lighting as a first option; followed by minimum intensity, maximum off-phased red strobe lighting; and finally with minimum intensity maximum off-phased red blinking incandescent lighting. Pending FAA approval, all L-810 steady burning lights should also be removed as part of the retrofit.
- 2) All new towers must be fitted in decreasing order of priority with white strobes, red strobes, or blinking incandescent lighting as previously recommended. No L-810 side lights should be used.
- 3) When L-810 lights burn out, they should each be replaced in decreasing order of priority with white strobe, red strobe, or red blinking incandescent lighting as previously recommended.
- 4) From the time this rulemaking is finalized and published as regulation, we recommend that all towers be retrofitted within no longer than 5 years of that date (preferably a shorter duration) in decreasing order of priority with white strobe, red strobe, or red blinking incandescent lighting as previously recommended. No L-810 side lights should be used."

The U.S. FWS Tower Guidelines recognized the importance of strobe lighting. They provide:

"5. If taller (>199 feet AGL) towers requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA."

The U.S. FWS in its 2000 Guidelines then noted concerns over the use of solid red or pulsating red warning lights at night. The Guidelines noted that then current research indicated that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights, and that red strobe lights have not yet been

studied. However, the recent research noted above has resulted in a much better understanding of the role of lighting and the colors of lighting in avian mortality.

As noted in Longcore et al. LPP filing in this NPRM, “Researchers hypothesize that the key factor in the reduction of mortality at white strobe lights is the break in flashes and not the nature of the flash itself. Gauthreaux, S.A., Jr., and C. Belser. 2006. *Effects of artificial night lighting on migrating birds*. In C. Rich and T. Longcore (eds.), *Ecological Consequences of Artificial Night Lighting*. Island Press, Washington, D.C. A decision to require red strobe/flashing lights with a complete dark phase and synchronized flashing would be supported by the existing scientific literature.”

We also note that only one large bird kill has ever been reported at exclusively strobe-lighted towers and that one reported instance was linked to the presence of other lighting at ground level at the site. See the Longcore et al. LPP filing in this NPRM. Steady burning lighting at ground level shining into the night sky, including the lighting on the exterior of auxiliary buildings can cause mass bird mortality events.

To reduce avian mortality and to eliminate mass mortality at towers, it is very important that accessory structures at towers not use steady burning exterior lighting shining up into the night sky. Any related structures should not be lit unless required by the FAA, and these lights should be shielded and kept to a minimal intensity. The largest single avian mortality event ever recorded at a wind turbine site (33 birds found) is believed to have been caused by the combination of a heavy fog in spring migration and the presence of several bright, sodium vapor lights on a substation building near a turbine. This was at the 44-turbine Mountaineer Wind Energy Project in West Virginia, where the building lights were eventually turned off after the mortality event and no such event has occurred since then. Kerns, J. and Kerlinger, P. 2004. *A study of bird and bat collision fatalities at the Mountaineer wind energy center, West Virginia*, annual report for 2003, Curry and Kerlinger, New Jersey. The authors also note that attraction of birds to these types of lights “has been reported repeatedly from sites in West Virginia and elsewhere.” A total of 69 bird fatalities were collected by researchers, 47.8% from the one night. Only 12 of the 44 turbines are lit, and all 12 employ red strobe-like lighting.

The U.S. FWS Tower Guidelines provide that:

“10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.” And the comments by the FWS on this NPRM also urge the adoption of measures by the FCC to deal with this auxiliary lighting.

At the Foote Creek Rim (Wyoming) wind energy facility, average per guyed meteorological tower mortality was approximately 3 times higher than per turbine mortality. Lit and guyed meteorological and communication towers at turbine sites have more fatalities per tower than the bird fatalities per turbine of operating turbines, even those lit with red strobe-like lighting. Thus the necessity for keeping these permanent met and communication towers unguyed and unlit. Any structure can become lethal to birds in inclement weather if brightly lit and the FCC should act to require avoidance of lights on accessory structures at communication towers. See Young, D.P., Jr., W.P. Erickson, R.E. Good, M.D. Strickland, and G.D. Johnson. 2003. *Foote Creek Rim final bird and bat*

mortality report: avian and bat mortality associated with the initial phase of the Foote Creek Rim Wind Power Project, Carbon County, Wyoming. November 1998–June 2002. Final Report. Western EcoSystems Technology, Inc., Cheyenne, Wyoming.

Longcore et al. in the LPP filing in this NPRM conclude that: “The FCC has proposed to take action that would reduce the mortality of birds at communication towers by regulating the type of lighting system on towers. Specifically, the FCC has correctly identified white strobe lights as the lighting system for which there is most scientific evidence for a reduction of avian mortality. We furthermore conclude, based on recent studies, that flashing red or red strobe lights, both with a synchronized dark phase, would also dramatically reduce avian mortality. This action may be as simple as extinguishing the solid red lights currently at towers, leaving flashing red lights.”

In the NPRM, the FCC requests comment on the adoption of additional lighting guidance in rules, revisions to other provisions of Part 17, or elsewhere and encourage commenters to suggest specific language. We therefore propose that the following specific language be adopted by the FCC under this NPRM as part of the antenna structure approval and registration process. This is the second part of our recommendations, following our recommendations in Part B) above:

- 1) If a new antenna tower structure must be built, and if the structure cannot practicably be kept under 200', the FCC shall require that medium intensity white strobe lights for nighttime conspicuity is to be considered the preferred system over red obstruction lighting systems to the maximum extent possible without compromising safety. See the April 6, 2004 Memorandum from the FAA Program Director for Air Traffic Airspace Management. These medium intensity white strobe obstruction lights for nighttime conspicuity for pilot safety are designated for use by the FAA as L-865 flashing lights in FAA Advisory Circular (AC) 70/7460-1, Obstruction Marking and Lighting, Chapter 6. The pulse rate should be kept as close to the FAA minimum requirement of 40 flashes per minute as reasonably possible, and the lights shall flash simultaneously.
- 2) In cases where the antenna tower is to be located in urban/populated areas, within three nautical miles of an airport, or where for other reasons of aviation safety or zoning requirements use of L-865 white strobe lights for night time conspicuity is not possible, and the applicant demonstrates such, medium intensity red strobe lights shall be used exclusively. These medium intensity red strobe lights for nighttime conspicuity for pilot safety are designated for use by the FAA as L-864 flashing red strobe lights in FAA Advisory Circular (AC) 70/7460-1, Obstruction Marking and Lighting, Chapter 5. The pulse rate should be kept as close to the FAA minimum requirement of 20 pulses per minute as reasonably possible, and the lights shall flash simultaneously.
- 3) The use of steady-burning red obstruction lights, FAA L-810, should be avoided.
- 4) All existing registered antenna structures that employ red steady burning lights (FAA L-810) for night time conspicuity shall be required to phase in the FAA preferred white strobe lighting (FAA L-865) system to replace red steady burning lights. Existing towers

that are both guyed and that use red steady burning lights should be made priorities for retrofitting with white or red strobe or strobe-like lights. If replacement of the L-810 lights with white strobes (L-865) is not possible for reasons of aviation safety or zoning requirements and the registrant demonstrates such, then the use of L-864 red strobe or fast blinking lights for night time conspicuity shall be employed. This should occur when steady burning red lights (L-810) on existing antenna structures burn out and need to be replaced. All such towers shall terminate the use of red steady burning lights for nighttime use within five years of finalization of this rulemaking. If the existing antenna tower structure already employs white (L-865) or red strobe or fast blinking lights (L-864) exclusively for nighttime conspicuity, no changes need be made.

5) Accessory structures at towers should not have steady burning exterior lighting shining up into the night sky, and such structures should not be lit unless required by the FAA or because of security considerations. All such lights should be shielded and kept to a minimal intensity. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.

D) GUY WIRES.

In the NPRM at paragraphs 13-19, the FCC seeks comments on whether we should adopt any requirements governing the use of guy wires because of the potential impact posed to migratory birds, the FCC cites the September 2004 Avatar Report, concluding that, based on the studies it analyzed, it appears that "[t]owers with guy wires are at higher risk [to birds] than self-supporting towers." The FCC then notes that: "Avatar also stated, however, that at the time of its report there were "[n]o specific studies comparing avian collisions between guyed and self-supporting structures...Gehring's interim reports on the Michigan towers, presented subsequent to the Avatar report, suggest that towers with guy wires had more avian mortality than towers of similar height with no guy wires. In light of this record, we request comment on several questions relevant to whether these concerns are significant enough to justify the Commission's adoption of rules relating to the use of guy wires."

The concerns over the use of guy wires are significant enough to justify the Commission's adoption of rules relating to the use of guy wires.

The Gehring and Kerlinger Michigan study Report I included 12 guyed and 9 unguyed communications towers 380-480 feet tall, and three towers more than 1,000' tall that were all guyed. The authors stated that: "we determined that unguyed towers 116-146 m AGL experienced significantly fewer fatalities than towers of the same height that were guyed. Approximately 54 - 86% fewer fatalities were registered at guyed towers 116-146 m as opposed to guyed towers >305 m. Nearly 16 times more fatalities were found at guyed towers 116-146 m in height as opposed to unguyed towers of the same height. Tall guyed towers were responsible for about 70 times as many birds fatalities as the 116-146 m unguyed towers and nearly 5 times as many as guyed towers 116-146 m. These data provide managers and regulators with the first quantitative data for establishing best

practices to minimize collision fatalities of migrating and other birds at federally licensed communication towers

Our results are consistent with the prediction that guyed towers are associated with higher bird fatality rates than unguyed towers. According to these data bird fatalities may be prevented by 69% -100% by constructing unguyed towers instead of guyed towers. These results are consistent with results reported by Kruse (1996), who plotted the location of migrant bird carcasses under three guyed communication towers. Kruse (1996) found a significant positive correlation between the locations of tower guy wires and bird carcasses, thus supporting the hypothesis that birds collide mostly with the tower guy wires

Given the increasing number of communication towers in the U.S. and a growing interest in addressing the bird collision issue, this study is of particular importance (Shire et al. 2000, Erickson et al. 2001, FCC 2003, 2005, 2006). Our results show that bird fatalities may be reduced by 69% to nearly 100% by constructing unguyed towers instead of guyed towers, and 54%-86% by constructing guyed towers 116-146 m AGL instead of guyed towers >305 m AGL. This information is the most useful provided to date for mitigating and preventing avian fatalities at towers. This research provides quantitative information necessary to the FCC, the National Environmental Policy Act (NEPA) responsible agency that governs communication towers (FCC 2005). The present study also provides regulatory bodies, trust agencies, and other stakeholders with quantitative and statistically valid information regarding the relative risk of towers of different heights and towers with and without guy wires. This information can be directly applied to future tower design, siting, licensing, and permitting and would reduce substantially the numbers of fatalities of migratory and non-migratory birds resulting from tower collisions.”

Besides the citation to Kruse above, the U.S. FWS comments on this NPRM note: “In a recent study at guyed communication towers in Wisconsin, Kruse (1996) found a high correlation between the specific locations of dead birds and their immediate proximity to guy support wires. The study strongly implicated the guy wires as the cause of death. Kruse, K. 1996. *A study of the effects of transmission towers on migrating birds*. M.Sc. thesis, Environmental Science and Policy, University Wisconsin, Green Bay. (1996).

In their comments, the U.S. FWS also refers to their Guidelines suggesting that guy wires not be used and notes that: “The MSP tower study (Gehring et al. 2006) provides the most definitive evidence yet available regarding the impacts of tall-guyed (> 1,000 ft AGL) and medium-height guyed (380-480 ft AGL) towers on migratory birds...Recommendation to FCC: These findings further reinforce the Service’s second and seventh recommendations in our voluntary communication tower guidelines to avoid using guy wires whenever possible, and to construct towers no higher than 199 ft AGL, avoiding lighting. The Service recommends that:

1) the FCC — provided they have the authority — require tower owners and operators to collocate proposed new communication towers on existing towers or other tall structures such as water and electric transmission line towers, where practical. New towers should be designed structurally and electronically to accommodate the applicant’s antenna and antennas for at least 6 to 10 additional users, unless the design would require the addition

of lights and/or guy wires to an otherwise unlit and/or unguyed tower. This suggestion coincides with the Service's first 2000 voluntary tower guideline.

2) The FCC establish by rule that communication towers, where practicable, be less than 200 ft AGL in height,

3) be of monopole or lattice design,

4) contain no guy wires and no lights, and

5) that this rule represent the environmentally preferred industry standard for tower placement, construction, and operation.

6) We suggest the FCC require this standard for the construction of all new communication towers, where possible, and the repair or re-construction of outdated or existing damaged towers, and the upgrade and modification of existing towers, again where monopole or lattice replacements can be used.

7) We suggest that the FCC require that towers no longer functioning be removed within 12 months of becoming inoperative, coinciding with our 12th voluntary guideline.

8) Where tower height and guy wires become an issue, the Service recommends more, shorter, un-guyed towers as opposed to fewer but higher, guyed and lighted towers in order for operators to provide equivalent service. This coincides with the seventh recommendation in our guidance where we suggest that a larger footprint is preferable to the use of guy wires.

9) Taller towers exceeding 199 feet in height, up to some 800+ ft AGL, do not necessarily need to be guyed. For example, an un-guyed, lattice tower near the campus of Catholic University, Washington, DC, is some 750 ft AGL in height. We recommend that the FCC work with tower owners and operators, environmental representatives, and agencies to agree upon a minimum communication tower threshold height above the 199-ft AGL level where towers would remain unguyed (i.e., monopole or lattice), recognizing that in areas subjected to hurricanes, tornadoes, williwaws and high winds, they may need to be guyed."

The hazard of guy wires to migrating birds has also been investigated by those working with wind power producers. West Inc. researcher Wally Erickson reported that "Based on computer models, for a bird with a one-foot wing span, the likelihood of collision with a 105 m high communications tower having 1.25 miles of guy wires is three times as great as the likelihood of colliding with a 65-m rotor diameter, 92 m maximum height wind turbine...empirical data from a wind energy project in Wyoming corroborated the higher per structure collision risk for a guyed structure compared to a wind turbine for songbirds. Erickson, Wally, *Bird Fatality and Risk at New Generation Wind Projects* (West, Inc.) 2004, in the Proceedings of the Wind Energy and Birds/Bats Workshop: *Understanding and Resolving Bird and Bat Impacts*, Washington, D.C. May 18-19, 2004. Prepared by RESOLVE, Inc., Washington, D.C., Susan Savitt Schwartz, ed. September 2004.

The computer modeled wind turbine was unguyed as are all wind turbines except for a few small, older turbines. The Wyoming wind energy project cited is at the Foote Creek Rim wind energy facility. The average number of birds killed per guyed meteorological tower was approximately 3 times higher than the per turbine mortality. The turbines are unguyed. Young, David P., et al., *Foote Creek Rim Final Bird and Bat Mortality Report*:

Avian and Bat Mortality Associated with the Initial Phase of the Foote Creek Rim Wind Power Project, Carbon County, Wyoming. November 1998--June 2002. Final Report. January 10, 2003. West, Inc., (2003).

Other recent U.S. studies indicate that bird mortality at wind turbine projects varies from less than one bird/turbine/year to as high as 7.5 birds/per turbine/year. The latter fatality rate was at Buffalo Mountain, TN in 2003, where three unguyed wind turbines are in use, each with a 154' diameter, 3-blade rotor mounted on a 213' tall tubular steel tower. A guyed unlit 197' meteorological (met) tower constructed for the Buffalo Mountain wind plant had a mortality rate of 8.1 birds/year, greater than the average fatality rate for the three wind turbines. Mortality was monitored from October 2000, when construction was completed, through September 2003. Charles P. Nicholson, PhD., Tennessee Valley Authority, 400 West Summit Hill Drive, WT 8C, Knoxville, TN 37902-1499, personal communication, March 26, 2004. cpnicholson@tva.gov.

Guyed meteorological and communication towers at wind turbine sites appear to have more bird fatalities per tower than fatalities per turbine, even though the turbine tips fully extended are at higher above ground elevations and the blades are spinning. This appears to be related to wind turbines being unguyed and to their strobe lighting systems. This further corroborates the significant influence of guy wires and lights on avian mortality.

Longcore et al. in the LPP filing in this NPRM conclude that: "Higher mortality from guyed towers is expected because of the circling behavior exhibited by migrants under the influence of lights on towers. Furthermore, a study of bird mortality at transmission towers in Wisconsin found a high correlation between the locations of dead birds and guy wires, implicating collisions with guy wires as the cause of death. Deaths of birds at guyed towers is so common that when mortality occurs at towers without guywires, researchers take special note....recent studies furthermore confirm our literature review in concluding that guywires dramatically increase mortality at towers. For any given height, guywires increase bird mortality. Consequently, there would be scientific support for regulating tower design to avoid use of guywires where feasible. We conclude that this action would be secondary to a change in lighting design, but would be necessary to *minimize* avian fatalities at towers."

The scientists/authors also note that "Changing lighting on towers to strobe-type lights only would reduce the influence of guywires on nocturnal mortality by removing the attractive influence of lighting. Guywires would still kill birds through blind collisions and daytime rates would not be changed." Please see their comments on this NPRM for the citations documenting their conclusions on guy wires.

Based on the significant hazard guy wires on communication towers present to migratory and other birds, we suggest the FCC adopt the following measures in its antenna structure approval and registration process:

- 1) Guy wires should not be allowed on any new antenna structure under 200' in height AGL, unless the applicant can demonstrate extraordinary circumstances. For any antenna tower that is to be between 200' and less than 500' AGL, the applicant should not use guy

wires unless certification is submitted by a qualified engineer that the structure cannot practicably be built as a monopole or of lattice design. In considering practicability, the applicant must demonstrate that guy wires are necessary because the tower cannot be built as a monopole or lattice structure because of safety concerns, significantly higher costs, or due to other engineering factors that require the use of guy wires.

2) If a proposed new tower will use guy wires for support and the tower and guy wires are proposed to be located in a known raptor or waterbird concentration area or in raptor or an area of waterbird daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, or on towers known to cause daytime avian mortality, the tower shall use effective daytime visual markers on the wires to prevent collisions by these diurnally moving species.

3) 47 C.F.R. §1.1307 should be amended to require that an applicant for a new antenna structure must review and evaluate the following, at a minimum, concerning guy wires: Is the proposed antenna structure to be constructed and operated so as to avoid, or at least minimize, the likelihood of causing fatalities to any migratory birds, and specifically U.S. FWS Birds of Conservation Concern, including avoiding the use of guy wires where possible? If guy wires are to be used, a NEPA EA would be required.

4) Existing towers that are both guyed and that use red steady burning lights should be made priorities for retrofitting with white or red strobe or strobe-like lights.

Finally, we note that the FCC in this NPRM has requested advice on balancing the various scientific, engineering, economic, and other factors, in determining what, if any, standards should govern the use of guy wires. Because of the potential costs and difficulties inherent in removing guy wires on existing towers, we have not advocated their removal. However, we do advocate that red steady burning lights (L-810) on existing guyed towers be turned off and replaced with white or red strobe or strobe-like lights.

We also note that under current FCC practices in its antenna structure approval and registration process, the industry applicants are given free hand in determining whether a tower is guyed or unguyed, despite any impacts to birds or other ecological considerations. Hence, decisions are now based and have been based in the past on economic considerations—what is the cheapest way to build out telecommunications infrastructure—or on what is otherwise most expeditious, with no requirements for preventing avian mortality or even taking it into consideration. This must change under NEPA, MBTA, and ESA as guy wires can impact ESA-listed species.

Fryer's Site Guide from 2002 notes that of 70,616 towers identified of 201'-400' AGL, an estimated 45% are guyed; for the towers from 401'-500', it was 75% guyed, and 501'-999', it was 87% guyed. Clearly, most towers do not need to be guyed. When towers are guyed, even similar towers at 380'-480' that differ only in being guyed or unguyed, the guyed towers kill 16X more birds than unguyed towers. "According to these data bird fatalities may be prevented by 69% -100% by constructing unguyed towers instead of

guyed towers.” Gehring and Kerlinger, Report I.

E) TOWER HEIGHT.

The FCC seeks comment in paragraphs 20 and 21 of its NPRM on whether to adopt any requirements relating to the ‘height of communications towers in order to minimize the impact of such towers on migratory birds. The FCC notes that “Avatar found that ‘all other things being equal, taller towers with lights tend to represent more of a hazard to birds than shorter, unlit, towers.’ FWS’s voluntary guidelines recommend that communications towers be shorter than 200 feet if possible to avoid, in most instances, the requirement that the towers have aviation safety lights.”

The research in Michigan by Dr. Joelle Gehring and Dr. Paul Kerlinger that is cited above compares bird mortality rates at 380’-480’ unguyed towers, 380’-480’ guyed towers, and tall guyed towers, all located in the same geographic area. These towers were not known to be susceptible to bird collisions prior to the study. Adjustments were made for searcher efficiency and scavenger removal, but these did not change the character of the raw results. The researchers conclude in their Report I that: “Our results also support the prediction that many more avian collisions occur at taller towers. Data indicate that 68%-86% fewer fatalities were registered at guyed towers 116-146 m AGL than at towers > 305 m AGL. Similarly, a long-term study at a communication tower in Florida detected a dramatic decrease in bird fatalities after the tower height was decreased from 308m to 91m AGL (Kerlinger 2000). ..Tall guyed towers were responsible for about 70 times as many birds fatalities as the 116-146 m unguyed towers and nearly 5 times as many as guyed towers 116-146m.”

This study provides further (evidence of the effects of height on chronic bird collisions with lighted, guyed towers. Bird mortality was much lower at the shorter towers with the same lighting type as the tall towers.

Longcore et al. in the LPP :filing in this NPRM have conducted a new, detailed meta-analysis of tower height and bird collisions that is consistent with the findings as the Gehring and Kerlinger study and other published data in linking tower height to increased avian fatalities. They conducted a meta-analysis of communications towers that shows that bird mortality is positively correlated with tower height. Their study uses annual mortality estimates from 28 studies that met certain criteria. They found that tower height was strongly and significantly correlated with annual bird mortality. Even when shorter, unlit towers were removed from the database, they found a similar, significant relationship. See their filing in this NPRM and their paper that has been submitted for publication. Longcore, T., C. Rich, and S.A. Gauthreaux Jr. In review. *Design and siting of communication towers and rate of avian mortality: a review and meta-analysis.*

Their analysis linking tower height with increased avian mortality is consistent with the Gehring and Kerlinger study and with surveys of bird kills after taller towers have been replaced with shorter towers. For example, Longcore et al. cite the Crawford and Engstrom publication reporting substantially decreased mortality following the reduction

of a 1,008-foot tower to 284 feet. Crawford, R.L., and R.T. Engstrom. 2001. *Characteristics of avian mortality at a north Florida television tower: a 29-year study*. Journal of Field Ornithology 72:380–388.

In the Longcore submittal on this NPRM, they find that: “The statistically significant relationship between tower height and bird mortality is consistent with studies of the vertical distribution of nocturnal migrants measured with radar. Most migrants fly at –1,500 feet, with a small proportion (2–15% in one study) below 300 feet during clear weather. Greater proportions, of total migrants (26–46%, depending on the season and location) are found in the strata up to –1,300 feet, although the strength of radar used in that study may underestimate the number of birds at higher altitude.” See their submittal for the citations documenting these findings.

Longcore et al. conclude “We :Furthermore reiterate the correlation between tower height and avian fatalities. Minimization of tall towers through whatever technical means possible would serve to reduce avian mortality ...The existing data would support the FCC adopting these recommendations as standards to better protect birds. Such standards for tower construction do not mean that towers exceeding 199 feet or any other height should not be constructed, only that the FCC would strongly encourage collocation and the construction of shorter towers to accomplish telecommunication goals while minimizing avian impacts.”

Mass mortality events almost never occur at towers under 400’-500’. The taller towers kill many more birds, generally, than the shorter towers per tower. However, the FCC should be cognizant that there is evidence that the majority of fatalities at towers cumulatively occurs at towers from 200’-600’ AGL, and that the Longcore et al. analysis submitted as part of this NPRM confirms this. Table 1 of their submittal details the estimated mortality broken down by tower height. Towers that are less than 400’ account for 1.8 million of the 4.3 million estimated annual fatalities under their conservative estimates. This is because of the large number of towers at these lower heights. This data has clear implications for the FCC in acting on the bird fatality problem and indicates that tower lighting and guy wires, even on towers under 400’, need to be adjusted to prevent avian mortality. Further, existing towers under 400’ also need to abide by the lighting requirements for extinguishing the red steady burning red lights (L-810).

In its comments filed in this NPRM, the U.S. FWS confirms the link to height and avian fatalities and makes a series of recommendations that coincide with their Guidelines for collocation, keeping towers under 200’, and further recommending that “Where tower height and guy wires become an issue, the Service recommends more, shorter, un-guyed towers as opposed to fewer but higher, guyed and lighted towers in order for operators to provide equivalent service.”

Based on the significance of tower height to avian mortality at communication towers, we suggest the FCC adopt the previously cited recommendations on collocating antenna on

existing structures, keeping towers under 200' where possible, keeping towers under 500' unguyed where possible, and requiring existing and new towers to avoid use of red lights (L-810). We also suggest that the FCC adopt these additional measures in the FCC antenna structure approval and registration process for new antenna structures that will exceed 400' AGL:

An applicant for an antenna structure shall submit a written declaration to demonstrate why the tower they propose for construction must be constructed to exceed 400' AGL. The declaration shall contain documentation that the tower height chosen is necessary for their provision of cellular, TV, radio, or other telecommunication services, and why a tower of a shorter height would not suffice.

F) TOWER LOCATION.

In the NPRM at paragraph 22, the FCC seeks comment on tower location and migratory bird impacts. Such locations as wetlands, ridges, mountains, or other high ground may have "a differential impact on migratory bird populations" and comments are also sought on the impact on migratory birds of towers located in areas with a high incidence of fog, low clouds, or similar obscuration, or in proximity to coastlines and major bird corridors. The FCC notes that: "Although Avatar noted some degree of confidence within the scientific community that the 'greatest bird mortality tends to occur on nights with low visibility conditions, especially fog, low cloud ceiling, or other overcast conditions, it reached no similar findings with regard to the effect that locating towers on ridges, or in wetlands, might have on avian mortality. Information is sought on the science on these issues and whether there any requirements the FCC should adopt on the basis of such studies.'"

The U.S. FWS Tower Guidelines provide that:

4. If at all possible, new towers should be sited within existing "antenna farms" (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (*e.g.*, state or Federal refuges, staging areas, rookeries), in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in, areas with a high incidence of fog, mist, and low ceilings,
7. Towers and appendant facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower "footprint". However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.
8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternate site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.

The above provisions represent the application of the best science available to the migratory bird expert biologists at the FWS, and their Guidelines are based on that science. The U.S. FWS Director noted that "These guidelines were developed by Service personnel from research conducted in several eastern, Midwestern, and southern states, and have been refined through Regional review. They are based on the best information

available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers. We believe that they will provide significant protection for migratory birds.”

We suggest that the FWS Guidelines, as modified in Section II above, be incorporated as part of the new rule governing the FCC review, approval, and registration of towers. We further suggest that to assure that tower construction does not adversely affect ESA-listed species or migratory birds, that each new tower application should be submitted to the U.S. FWS regional office for a determination of whether any threatened or endangered species are in the area and potential effects on such species, as well as a review by the regional office of potential migratory bird impacts, and whether the tower would be constructed and operated so as to avoid taking migratory birds. The FCC acknowledges in the NOI at page 14, that it is not expert in migratory birds and that the FWS is the lead Federal agency for managing, and conserving migratory birds and possesses the requisite expertise. Given that the FCC acknowledges that it has no in-house capability to ascertain whether individual antenna structures may affect migratory birds or ESA-listed species, the FCC should require the U.S. FWS review and comment, especially on the location of a tower. Again, the FCC should assure that the applicant adopts the avoidance measures detailed in Section II above to prevent, or at least minimize, bird fatalities regardless of the tower location.

Obviously, the location of a tower can be a significant factor in bird mortalities and such location, along with other factors, should be reviewed by the regional biologists at the U.S. FWS. All towers located where migratory birds might be killed should adhere to the measures mentioned herein to prevent fatalities, including the measures for collocation, avoidance of guy wires, use of only strobe lighting and avoidance of L-810 steady burning red lights, and minimization of tower height.

We also have proposed in Section II above that 47 C.F.R. §1.1307 be amended to require that an applicant must review and evaluate whether the proposed antenna structure is located in a migratory bird corridor, on a ridge, near a wetland, or in or near a wildlife area such as a refuge or park, or in any other area that attracts migratory birds, and if it is, this would trigger the requirements for an EA would be triggered. This EA would be conducted after the FWS regional review of the tower. The other requirements for the avoidance measures detailed in Section II above should be applied to all towers, but in cases where migratory birds may be affected, the FCC should closely review the application and assure full compliance.

C) MONITORING OF TOWERS SHOULD BE REQUIRED.

The FCC should require antenna structure owner/operators to scientifically assess avian mortality at each tower that is more than 500' AGL during at least one spring and fall migration season if the tower is guyed, and if the tower still employs red steady burning aviation safety lighting for night time conspicuity. If the tower owner/operator agrees to switch the L-810 steady burning red lights to L-865 or L-864 lights, then the monitoring requirement can be waived.

New towers that exceed 300' that are located where ESA-listed species or Birds of Conservation Concern species fly by should be required to be scientifically monitored during at least one spring and fall migration season for mortality if the towers are guyed and employ red steady burning red lights (FAA L-810) for night time conspicuity. Reports of the avian fatalities at these towers from on-the-ground searches during spring and fall should be statistically adjusted for predator removal and searcher efficiency.

These reports should be delivered to the FCC by the end of the calendar year in which they were conducted. The reports shall be available to the public.

Only with such systematic monitoring can the FCC fully comply with NEPA, MBTA, and ESA and better ascertain the mortality at towers under its jurisdiction and the full impact on migratory birds. NEPA requires such analyses. Instead, the FCC uses the failure to document mortality at the vast majority of towers as an excuse for inaction, despite the scientifically documented incidences and studies of widespread avian mortality at towers.

Our specific proposals for monitoring are found in Section II above.

In the comments on this NPRM filed by the U.S. FWS, the FWS also recommends monitoring: "We recommend that FCC require through rulemaking a post-construction monitoring process that assesses and evaluates mortality and/or habitat fragmentation and disturbance at a statistically significant sample of communication towers of different height classes (i.e., unlit, lit, un-guyed, guyed, cellular, radio, television, DTV, emergency broadcast, and others) within the United States. Ideally, post-construction monitoring should be required for at least 3 years post-development, and mortality would be reported annually to the FWS as a condition of a scientific collecting permit."

H) WHY DO COMMUNICATION TOWERS CAUSE MASS MORTALITIES OF BIRDS AND WIND TURBINES WITH MOVING BLADES DO NOT?

A comparison of avian mortality at wind turbines with communication towers is instructive for finding solutions. Night migrating birds in spring and fall are particularly susceptible to collisions with structures such as communication towers and potentially wind turbines, especially on poor visibility nights when their celestial navigation systems become confused by the lighting on such structures. Red steady burning L-810 lights disorient the birds, the birds come to the lights on the tower, circle the tower repeatedly, collide with the tower guy wires, collide with each other, the tower, and the ground, die of exhaustion, or deplete their fat reserves. Mass mortality events exceeding a hundred birds occur all too frequently every spring and fall at communication towers, and mass mortalities of thousands of birds in one night are documented in the literature.

But such mass mortality has never been recorded at a wind turbine project of dozens, or even hundreds, of spinning turbine blades. Why not? A far greater percentage of wind turbines have been monitored than communication towers, so mass mortality of birds would have been noted. Bird mortality ranges from zero birds per turbine at some sites, to a high of 7.28 at three turbines at Buffalo Mountain, TN. Two years of monitoring data

at the 44-turbine Mountaineer, WV site indicates an avian mortality rate at 4.8 birds per turbine in 2003. All of these rates have been adjusted upward for searcher efficiency and predator removal.

In May 2003, 33 dead birds were found at the Mountaineer, WV site after a foggy night, and researchers believe that sodium vapor lights on an auxiliary building led the birds to their death. Since the lights were replaced, no mortality events of more than a few birds in a single day have been recorded. These 33 birds represent the highest single day mortality ever recorded at ~~an~~ entire wind energy project, not just a single turbine.

The best scientific explanation for the absence of mass mortality at wind energy projects and relatively low per turbine kills even on forested ridges, is that wind turbines do not use red steady burning L-810 lights, do not light each turbine, do not use guy wires, are monopoles, and generally do not exceed 400' AGL. So, because of proper lighting, the lack of guy wires and monopole construction, and height not exceeding 400', communication towers **kill** a lot of birds and wind turbines do not.

This comparison supports scientific data cited herein that supports preventative measures to eliminate or minimize such mortality at towers by keeping towers under 200' where possible, not using L-810 steady burning red lights and using white or red strobe lighting where lighting is necessary, keeping guy wires off of towers where possible and using monopole construction, and minimizing the height of towers. These measures should significantly reduce the millions of migratory birds killed unnecessarily at tower structures.

VI. CONCLUSION.

We believe that the measures detailed in Items 1) through 18) above in Section II should be adopted by the FCC at the conclusion of comments on this Notice of Proposed Rulemaking on May 23, 2007. We believe these measures are necessary to protect migratory and other birds and to bring the FCC into compliance with NEPA, the MBTA, and the ESA, and are fully authorized under these statutes and the laws governing the FCC and its antenna structure program. They can be accomplished under the implementing regulations of these statutes.

We believe that all the measures and process changes suggested to bring the FCC into compliance with NEPA, MBTA, and ESA that will lead to the prevention of the killing of millions of birds at towers will not in any way adversely affect the provision and build-out of telecommunication services in this country and will have no adverse effects on the deployment of wireless services, on homeland security, and on public safety. Towers, like wind turbines, can be sited and operated without killing birds, or so as to, at a minimum, substantially reduce bird kills. The industry may have to pay more attention to bird kills, and this may cost more, but it is a necessary cost of business.

We believe the documentation submitted herein and previously establishes that bird kills at towers are biologically significant for many species of birds, and that many of these species U.S. FWS Birds of Conservation Concern. The overall fatalities of at least 4.3

million birds warrants action by the FCC, but the disproportionate effects on certain declining species makes action by the FCC essential. Tower kills comprise 4% to 5% of the total population of some species—annually. Mortality of this magnitude is extraordinarily significant on a species basis and for individual populations.

We believe that the best science available supports the conclusion that communication tower height, lighting, and use of guy wires are the three most important factors contributing to bird kills that can be controlled by humans. Use of steady burning red lights (L-810) attract birds in far greater numbers than strobe lighting. That's why the FAA, the U.S. Fish and Wildlife Service, researchers and other scientists familiar with the issue, and conservationists all recommend the use of medium intensity white (L-865) strobe lights at night, with no other lights. If these cannot be used, the Gehring and Kerlinger Michigan research clearly documents that red strobes or blinking lights (L-864) be used without the red steady burning L-810 lights. Thus, it is of critical importance to migratory birds that new and **existing** towers not use the L-810 lights at night. This requires action by the FCC, including in dealing with these existing towers.

We believe that through the measures advocated in Section II above, the killing of birds at towers will be significantly reduced. The Gehring and Kerlinger Michigan Research Final Reports to the State of Michigan, both I and II, have been filed with the FCC as part of this NPRM. These Reports fully substantiate the measures advocated in Section II above and by the U.S. FWS in their February 2, 2007 filing in this NPRM.

The Gehring and Kerlinger Report I documents the necessity of keeping new tower as short as possible and unguyed as guyed towers of the same size killed 16 times more birds than unguyed towers. This makes it critical for the FCC to act to assure that antenna structures be collocated where possible, and new communication towers should be unguyed.

The Gehring and Kerlinger Report II concludes that "Our results demonstrate that avian fatalities can be reduced dramatically at guyed communication towers, perhaps by 50-70%, by removing steady burning L-810 lights. Changing lights on existing and new communication towers provides a feasible means to dramatically reduce collision fatalities at communication towers (two other methods include tower height reduction and guy wire elimination on new towers). One advantage of our findings is that lighting can be changed at minimal cost on existing towers and such changes on new or existing towers greatly reduces the cost of operating towers. Removing L-810 lights from towers is one of the most effective means of achieving a significant reduction in avian fatalities at existing communication towers. suggests that simply turning off the steady burning red lights (L-810) reduces avian fatalities by 50%-70%—and this regardless of whether the lights used are white strobes or red blinking lights authorized by the **FAA.**"

The authors note that "By simply removing the L-810 lights from all communication towers, it is possible that more than one to two plus million bird collisions with communication towers might be averted each year, assuming that about four million birds per year collide with communication towers (estimate from USFWS 2000). Because

guyed towers (or guy wires of those towers) now standing are not likely to be removed from the landscape, changing FAA obstruction lighting provides virtually the only means of reducing fatalities at existing towers.”

This makes it critical for the FCC to act to assure that existing communication towers end their use of red steady burning lights and use either white strobes or red strobes with the minimum intensity and number of pulses under FAA guidelines.

In its comments to the FCC on this NPRM, the FWS advises “In summary, the Service feels that immediate action needs to be taken to reverse these tower collision impacts on migratory birds....We strongly encourage the FCC to include in rulemaking the recommendations we are providing herein. If you do, avian collision mortality at communication towers should be significantly reduced, based on the best scientific evidence currently available....We encourage the FCC to include in rulemaking the recommendations suggested herein by the Service that will significantly reduce avian impacts but continue to allow providers full communication services and capabilities.”

As we enter the full spring migration period for our migratory birds, we anxiously await FCC action to adopt these measures as recommended above and by the U.S. FWS to end most of the killing of these birds at communication towers under FCC jurisdiction.

Respectfully Submitted,

George H. Fenwick, Ph.D., President
American Bird Conservancy
4249 Loudon Avenue
The Plains, Virginia 20198

John Talberth, Ph.D., President and Senior Economist
Center for Sustainable Economy (Formerly Forest Conservation Council)
1704-B Llano Street, Suite 104
Santa Fe, New Mexico 87505
(505) 986-1163

Betsy Loyless, Senior Vice President, Public Policy
National Audubon Society
1150 Connecticut Avenue NW, Suite 600
Washington DC 20036
(202) 861-2242

John W. Grandy, PhD., Senior Vice President
Wildlife and Habitat Protection
The Humane Society of the United States
2100 L. St. NW

Washington, DC 20037
(301) 258-3144

Brent Blackwelder, PhD., President
Friends of the Earth
1717 Massachusetts Ave., NVJ, Suite 600
Washington, DC 20036
(202) 879-4284

E-filing

Full name: Dr. Albert M. Manville, II

Wildlife Biologist, Branch of Bird Conservation

Division of Migratory Bird Management

U.S. Fish & Wildlife Service

Address: 4401 N. Fairfax Dr., MBSP-4107

Arlington, VA 22203

Docket No.: WT Docket No. 03-187, Reply Comments

Date: March 9, 2005

cc: Mr. Louis Peraertz, Esq.

Spectrum and Competition Policy Division

Federal Communications Commission

Dear Staff of the Federal Communications Commission:

The Division of Migratory Bird Management (DMBM), U.S. Fish & Wildlife Service (FWS or Service), is pleased to provide the following reply comments. These respond to specific comments submitted last month regarding recommendations to reduce migratory bird collisions with communication towers submitted by Avatar Environmental, LLC (Avatar). Our reply comments follow a process initiated by a Notice of Inquiry (NOI), published by the Federal Communications Commission (FCC) in August 2003 – In the Matter of Effects of Communication Towers on Migratory Birds. The Service provided detailed public comments and suggestions on this document in 2003 following its publication, and we provided comments on Avatar's report on February 11, 2005.

DMBM is particularly interested in replying to the February 14, 2005, comments submitted by Drs. Travis Longcore, Sidney A. Gauthreaux, and Ms. Catherine Rich on behalf of the Land Protection Partners (LPP) entitled, "Scientific basis to establish policy regulating communications towers to protect migratory birds: response to Avatar Environmental, LLC, report regarding migratory bird collisions with communication towers, WT Docket No. 03-187, Federal Communications Commission Notice of Inquiry." In our opinion, the LPP comments provide a detailed and scientifically-sound analysis of current avian-communication tower interactions.

LPP raised the issue that the Avatar Report failed to cite current estimates for avian mortality at communication towers. DMBM acknowledges Avatar's failure to include the Service's most current estimated range of mortality from communication towers. Specifically, Manville (2001) conservatively estimated avian mortality at 4-5 million birds/year, recognizing that mortality could range to a high of 40-50 million birds/year, with only cumulative impact studies assessing the true magnitude of the problem.

LPP clearly characterized the issue of "biological significance" to avifauna, especially based on 2003 comments to the NOI provided by the Cellular Telecommunications & Internet Association (CTIA), as an issue founded not on science but rather on a statutory standard under the National Environmental Policy Act (NEPA). We concur with this analysis. The Avatar Report, however, did not outline the standards used by the FCC to determine significance (LPP p. 4). LPP indicated that the report prepared for the communications industry by Woodlot Alternatives produced an annual estimate for avian mortality for all birds, not for particular species or populations (LPP p. 5). The Service concurs that this is a flawed approach. Impacts must be assessed on a species-specific or population-specific basis.

In Section 2.1 of the LPP Report, "Estimate of numbers of birds killed at towers by species," LPP took the list of the top 10 birds killed per year at communication towers, and estimated mortality for each species using the Service's low-end estimate of 4 million and high-end estimate of 40 million birds of all species killed per year. This novel approach, even at the 4-million bird level, results in some telling statistics. Looking only at the top 10 bird species for which mortality has been documented at communication towers, mortality is estimated to range from 490,000 to 4.9 million birds for each of the 10 bird species based on annual mortality estimates developed by FWS! The population impacts to migratory songbirds (and other avifauna) and impacts to their population status are frightening and biologically significant. LPP referenced the Sillett and Holmes (2002) long-term study on the migrant Black-throated Blue Warbler. The Sillett and Holmes study showed a survival rate during the migratory period of only 67-73%, Compared to 99% (+ 1%) summer survival and 93% (+ 5%) winter survival, raising concerns about the increased number of communication towers and their impacts to this species during migration. For Federally-listed species, such as the Kirtland's Warbler, whose total estimated population numbers only 2,000 breeding individuals, tower mortality could be significant to the entire population. We therefore concur with LPP's recommendation to include all migratory birds as part of the FCC's NEPA analysis process (LPP p. 5). The Service first raised this concern at our 1999 public workshop on avian collisions at communication towers, held at Cornell University.

In Section 3, "Tower height affects bird mortality rate," LPP analyzed the relationship between tower height and the number of avian fatalities. In Section 3.1, they then investigated the relationship between tower height (including lit and unlit towers) and bird deaths, resulting in a regression analysis of significance. As a result of their analysis, LPP concluded that towers lower than 200 feet, with no FAA obstruction lighting, provided a 90-95% reduction in bird mortality. This recommendation, coincidentally, parallels the Service's second voluntary recommendation made in 2000, for siting and constructing towers. That is, if communication antennas cannot be collocated on other structures, keep them unguyed, unlit, and under 200 feet.

LPP (p. 17) cited the fall 2004 results of the Gehring, Michigan, tower study. While these findings are

very preliminary, they further reinforce Service concerns about guy wires. Dr. Gehring determined that guyed towers (N=12) killed nearly 10 times as many birds as did unguyed (N=9) towers in Michigan during the fall 2004. The study will continue for at least another 2 years.

LPP has provided a detailed and highly credible meta-analysis of lighting impacts to migratory birds (pp. 18-29). Without recapping all the key points presented by LPP, the Service acknowledges LPP's support of our lighting recommendation No. 5 included in our voluntary guidance. We are pleased to see the results of the Gauthreaux and Belser (2005) lighting study now published, which further support our lighting recommendation. We especially appreciate LPP's support of our guidance where they conclude that the Service's communication tower guidelines "... have a strong scientific basis, and their applicability has been demonstrated by research available at the time they were issued in 2000, or completed since then" (LPP p. 31).

In conclusion, paralleling recommendations made by LPP and suggestions previously made by the Service, we recommend the following:

- While avian-tower research is critically important, much more study needs to be systematically conducted on towers nationwide. This should include more research into lighting, deterrents, guys, height, topography and the interrelationship of these variables in affecting migratory birds.
- Where possible, all research protocols for tower studies should be peer-reviewed and the results published in credible, scientific journals.
- Since 2004, the Federal Aviation Administration has recommended that all their regions use the Service's voluntary lighting protocol for white strobe lights as a replacement for incandescent lights. The FCC needs to take similar action for all lighted towers they license.
- The FCC should endorse the Service's voluntary tower guidelines issued in 2000, strongly encouraging the industry to collocate antennas on existing structures while constructing shorter towers. These actions should not compromise communication needs.
- The FCC should endorse a nationwide study assessing the cumulative impacts of communication towers on migratory birds.

We hope all these aforementioned issues can be discussed in upcoming meetings of the Communication Tower Working Group's (CTWG) Research Subcommittee on April 21, 2005, and at a future meeting of the CTWG.

Respectfully submitted,

/s/

Albert M. Manville, II, Ph.D.

Wildlife Biologist,

Division of Migratory Bird Management

U.S. Fish & Wildlife Service